

CLAIMS

What is claimed is:

1. An electrostatic chuck, comprising:
 - a) a chuck body;
 - 5 b) an electrode, said electrode being embedded in the chuck body; and
 - c) an electrical contact extending from the electrode;wherein both the electrode and the electrical contact include a first metal and at least one of either the electrical contact or the electrode includes an alloy of the first metal and a second metal, all of said second metal being essentially
10 dissolved in the first metal.
2. The electrostatic chuck of Claim 1, wherein the first metal is selected from the group consisting of molybdenum, tungsten and a combination thereof.
3. The electrostatic chuck of Claim 1, wherein the second metal is selected from
15 the group consisting of nickel and cobalt and a combination thereof.
4. The electrostatic chuck of Claim 1, wherein the alloy further includes at least one additional metal.
5. The electrostatic chuck of Claim 4, wherein the additional metal is selected from the group consisting of rhodium, niobium, tantalum, hafnium and combinations
20 thereof.
6. The electrostatic chuck of Claim 5, wherein the additional metal component of the electrode is present in an amount that causes the coefficient of thermal expansion to be about that of the chuck body.

7. The electrostatic chuck of Claim 1, wherein the chuck body includes aluminum nitride.
8. The electrostatic chuck of claim 1, further including a plating at a surface of the electrode.
- 5 9. An electrostatic chuck, comprising:
 - a) a chuck body;
 - b) an electrode including a first metal, said electrode being embedded in the chuck body;
 - 10 c) a first electrical contact, said first electrical contact extending from the electrode, and including an alloy of said first metal and a second metal, wherein essentially all of the second metal is dissolved in the first metal;
 - d) a metallic heating element embedded in the chuck body; and
 - e) a second electrical contact extending from the metallic heating element, said second electrical contact including an alloy having a metal
15 component common to the metallic heating element, said alloy consisting essentially of a solution of metal elements.
10. A susceptor, comprising:
 - a) a ceramic body;
 - b) a metallic element embedded in the ceramic body; and
 - 20 c) at least one electrical contact, said electrical contact extending from the metallic element,
wherein both the metallic element and the electrical contact include a first metal and at least one of either the electrical contact or the metallic element includes an alloy of the first metal and a second metal, all of said second metal being
25 essentially dissolved in the first metal.

11. The susceptor of Claim 10, wherein the metallic element is a heating element.
12. The susceptor of Claim 10, wherein the metallic element is an electrode.
13. The susceptor of Claim 12, further including:
 - a) a metallic heating element embedded in the chuck body; and
 - 5 b) a second electrical contact, said second electrical contact including an alloy that includes a metal common to the metallic heating element, said alloy consisting essentially of a solution of metal elements.
14. The method of forming an electrostatic chuck, comprising the steps of:
 - a) molding a first portion of a green form of a ceramic material;
 - 10 b. forming a recess in said first portion of the green form;
 - c) depositing an electrical contact precursor in said recess, the electrical contact precursor including a first metal and a second metal;
 - d) depositing an electrode or an electrode precursor onto said first portion of the green form, whereby the electrode or electrode precursor overlays
15 said electrical contact precursor;
 - e) molding a second portion of the green form of the ceramic material onto the electrode or electrode precursor; and
 - f) heating the green form, thereby forming the electrostatic chuck.
15. The method of Claim 14, wherein the electrical contact precursor includes a
20 mixture of a powder of the first metal and a powder of the second metal.
16. The method of Claim 14, wherein the electrode or electrode precursor includes the first metal.
17. The method of Claim 14, wherein the second metal of the electrical contact

precursor essentially is completely dissolved or essentially completely soluble in the first metal of said electrical contact precursor.

18. The method of Claim 14, wherein the first metal is selected from the group consisting of molybdenum, tungsten and a combination thereof.
- 5 19. The method of Claim 14, wherein the second metal is selected from the group consisting of nickel and cobalt.
20. The method of Claim 14, wherein the electrical contact precursor further includes at least one or additional metal.
21. The method of Claim 20, wherein the additional metal component is selected
10 from the group consisting of rhodium, hafnium, tantalum, niobium and combinations thereof.
22. The method of Claim 14, wherein the electrode or electrode precursor includes a metal selected from the group consisting of molybdenum, tungsten and a combination thereof.
- 15 23. The method of Claim 14, wherein the ceramic material includes aluminum nitride.
24. The method of Claim 14, wherein the green form is heated by hot pressing the green form.
25. The method of Claim 14, further including the step of heating the first portion of
20 the green form to form a ceramic body, prior to overlaying the electrode or electrode precursor.

26. A method of forming an electrostatic chuck comprising the steps of:
- a) forming a chuck body including an embedded electrode;
 - b) forming an opening thereby exposing a portion of the embedded electrode;
 - 5 c) depositing an electrical contact precursor at the exposed portion of the electrode, wherein both the electrode and the electrical contact precursor include a first metal and at least one of either the electrode or the electrical contact precursor includes an alloy of said first metal and a second metal, all of the second metal being essentially dissolved in the first metal; and
 - 10 d) heating the electrical contact precursor thereby forming the electrostatic chuck.
27. An electrostatic chuck, comprising:
- a) a chuck body;
 - 15 b) an electrode including a first metal, said electrode being embedded in the chuck body; and
 - c) an electrical contact extending from the electrode, said electrical contact including an alloy of said first metal and a second metal, wherein essentially all of the second metal is dissolved in the first metal.
- 20 28. An electrostatic chuck, comprising:
- a) a chuck body;
 - b) an electrode embedded in the chuck body, said electrode including an alloy of a first metal and a second metal, wherein essentially all of the second metal is dissolved in the first metal; and
 - 25 c) an electrical contact extending from the electrode, said electrical contact including the first metal.